

# Oversight News

Newsletter of the Commonwealth's environmental oversight of the Paducah Gaseous Diffusion Plant

## Results of Southwest Plume Investigation Reported

The Department of Energy released the *Site Investigation Report for the Southwest Groundwater Plume* for regulator review and comment on Feb. 16. The report details the results of a summer 2004 investigation of possible sources of contamination to the Southwest Plume at the Paducah Gaseous Diffusion Plant.

The four areas investigated were the C-747-C oil landfarm, the northeast and southeast corners of the C-720 building, a storm sewer running from the C-400 building to discharge outfall 008 and the C-747 contaminated burial yard.

As its name suggests, the plume is located in approximately the southwestern corner of the Paducah site. The plume appears to flow to the north-northwest and, like the

Northwest Plume, also contains trichloroethylene (TCE) and technetium-99 (Tc<sup>99</sup>). However, the source of the Southwest Plume was not as well defined as that of its sister plume.

**The plume's zones of higher concentration are less expansive than first thought.**

New information gathered during this investigation suggests that several sources are fueling the Southwest Plume. The oil landfarm, C-720 building and C-747 contaminated burial yard all appear to be contributing TCE to the plume. Dense, non-aqueous phase TCE was identified during previous investigations at each of these three areas. However, results indicate that the C-747 contaminated burial yard is likely the primary source of Tc<sup>99</sup> detected in the plume. The investigation served to rule out the sewer line as a significant contributor of either contaminant to groundwater.

Another goal of the investigation was to better define the nature and extent of the Southwest Plume. Previous investigations such as Waste Area Group 27 and the Data Gaps project were instrumental in identifying and roughly defining the extent of the plume. Groundwater data obtained during this most recent investigation indicate that the plume's zones of higher concentration are less expansive than first thought and that the Tc<sup>99</sup> portion of the plume is not in contact with the C-747 contaminated burial yard, suggesting that the burial yard may no longer be releasing Tc<sup>99</sup>.

The site investigation report is currently under review by both the Kentucky Division of Waste Management and the U.S. Environmental Protection Agency. Once approved, the report will serve to guide any future remedial work designed to address the plume and its sources.

*By Todd Mullins, Ky. Division of Waste Management, Hazardous Waste Branch*

### In this issue

- Effort to Detail Contents of Storage Areas Continues ..... 2
- Ditch Sampling Plan Awaits Resolution ..... 3
- Kentucky Sample Results Added to Database ..... 4
- New Face at Site Office ..... 5
- Other Personnel Changes ..... 5

# Effort to Detail Contents of Storage Areas Continues

**D**epartment of Energy (DOE) contractors have characterized nearly a third of the approximately 160 DOE Material Storage Areas, or “DMSAs,” at the Paducah Gaseous Diffusion Plant (PGDP).

The work involves using industrial process knowledge, radiological surveys and sampling and analysis to determine if a waste is hazardous, non-hazardous, radioactive, mixed (both hazardous and radioactive), or subject to the requirements of the Toxic Substances Control Act. Wastes must also be packaged and stored properly according to the findings of the waste determination.

The DMSAs are specific areas, some inside PGDP buildings and others outside, where DOE stored various items, including wastes, that were not characterized and inventoried. After the state was informed of these areas, the Kentucky Division of Waste Management determined that DOE had violated hazardous waste statutes and regulations and its hazardous waste permit by failing to properly characterize the wastes stored in the DMSAs. As a result, DOE is required to properly characterize and manage all wastes within each DMSA according to state laws and regulations.

Fieldwork to characterize items in the DMSA also includes making an inventory of the DMSA contents and evaluating and addressing any nuclear

criticality safety concerns. After confirming the validity of lab results for all materials sampled, DOE submits an inventory and characterization report to the state. As of April 2005, DOE had issued reports for 47 DMSAs. Characterization work is under way in another 30 DMSAs.

Examples of items described in some of the DMSA inventories include wood pallets, rubber hoses, carts, tools, obsolete process equipment, empty drums, ladders, air conditioners, capacitors, fiberglass, paper trash, valve parts, office furniture, and motors, fans and pumps removed from equipment. Some items have been found that can be reused or recycled.

Hazardous (or mixed) wastes found in various DMSAs thus far include incandescent light bulbs, fluorescent light tubes, welding rods, circuit boards, batteries, and

oil or fluids drained from equipment. These items typically are determined to be hazardous wastes because of the levels of one or more heavy metals they contain. Other wastes like aerosol cans, sealing compounds and paint markers have been determined hazardous because of the temperature at which they are capable of igniting. Within 90 days of discovery, hazardous wastes are relocated to permitted storage areas or sent to a permitted treatment/disposal facility off site.

Among the DMSAs that have not had inventories completed, DOE is scheduled to complete characterization of six by 2006 and the remaining 108 by 2009. DOE began characterizing DMSAs in June 2001.

*By Lauren McDonald, Ky. Division of Waste Management, Hazardous Waste Branch*



**Repackaged drums of waste from a DMSA are stored in permitted area.** Photo by Brian Baker, Ky. Division of Waste Management.

# Ditch Sampling Plan Awaits Resolution

The Department of Energy (DOE) submitted the second-draft *Sampling and Analysis Plan for Site Investigation and Risk Assessment of the Surface Water Operable Unit (On-Site) for the Paducah Gaseous Diffusion Plant* to Kentucky regulators on Dec. 22, 2004. On Jan. 31, 2005, the state issued a conditional concurrence letter approving the document, provided that DOE would add one analyte, total PAHs, to Activity 1 of the sampling and analysis plan. On March 4, 2005 DOE invoked the dispute process described in the Federal Facility Agreement that guides site cleanup. The dispute is currently at the formal level, to be resolved by senior officials at the agencies.

Kentucky personnel began working on the investigation's scope with DOE and the U.S. Environmental Protection Agency in January 2004. The result of this cooperative effort was a first-draft sampling/analysis plan that required minimal modification. As the plan's development progressed, state and DOE project managers routinely communicated to resolve any issues concerning the project. All comments from Kentucky were based on data and narrative presented in the sampling and analysis plan. One of the state's comments on the first draft requested DOE to test Activity 1 samples for five additional

analytes. After discussions with DOE subcontractors and project managers, the state reduced the number of additional Activity 1 analytes to one.

The surface water investigation will be conducted through three activities:

- **Activity 1**, sampling to identify hot spots and their extent – 2,329 samples will be collected from internal ditches and outfalls; 284 samples will be collected from sections 3, 4 and 5 of the North/South Diversion

Ditch. DOE proposes to test the samples for total PCBs (polychlorinated biphenyls), uranium-238 and cesium-137. The state wants to add total PAHs (polycyclic aromatic hydrocarbons) to this activity.

- **Activity 2**, sampling to characterize contamination and to support risk assessment – 420 samples will be collected from the North/South and internal ditches and outfalls and analyzed for bulk metals, TCE (trichloroethylene), 1,1,1-trichloroethane, total PAHs, PCBs and radionuclides.

Storm sewers will also be investigated as part of activities 1 and 2. Up to 96 samples will be collected and analyzed for total PCBs, uranium and TCE. These samples will be used to evaluate the potential for chronic releases from PGDP storm sewers that could be adversely impacting off-site sediment and recreational/environmental receptors.

- **Activity 3**, data compilation and contaminant transport modeling – Data collected during activities 1 and 2, along with previously gathered data, will be used to develop mathematical models that estimate how far contaminants may migrate from source areas and at what levels.



**Outfalls and on-site ditches will be investigated as part of the Surface Water Operable Unit.** Photo by Lauren McDonald, Ky. Division of Waste Management.

(continued on page 4)



## Ditch Sampling Plan Awaits Resolution

(continued from page 3)

The state looks forward to a timely resolution of the dispute over PAH

sampling. There are numerous options Kentucky and DOE officials can discuss to resolve this technical disparity.

By **Jon Maybriar**, Ky. Division of Waste Management, Hazardous Waste Branch

## Kentucky Sample Results Added to Database

Fourteen sets of environmental data associated with the Paducah Gaseous Diffusion Plant were sent to Bechtel-Jacobs Corp. in December to be added to the Oak Ridge Environmental Information System (OREIS) database.

All of the data are for samples collected through the Agreement in Principle program administered by the Kentucky Division of Waste Management. Samples were analyzed at an independent lab not affiliated with the Department of Energy (DOE).

The OREIS database stores past and current environmental data associated with the Paducah plant, whether collected by DOE representatives, university researchers, state personnel or others. Once stored in OREIS, data can be queried in a variety of ways to yield information that can help involved parties make decisions about appropriate investigation and cleanup of different areas of the plant.

Recently added data include samples Kentucky personnel split with DOE in November and December 2003 from various

locations within the North/South Diversion Ditch inside the plant's fenced area.

Three sets are samples collected by a University of Kentucky research team headed by Dr. Alan Fryar. That research project is using an Agreement in Principle grant to investigate interactions between the Northwest groundwater contaminant plume and Little Bayou Creek.

The following data sets have been added:

### OREIS Project Code:

AIPSORUSP11-03  
AIPSORUSP11-03-02  
AIPSORUSP11-03-03  
AIPSORUSP11-03-04  
AIPSORUSP12-03  
AIPSORUSP12-03-02  
AIPSORUSP12-03-03  
AIPSORUSP12-03-04  
AIPSORUSP12-03-05  
AIPSOWGRURWSP11-03  
AIPWSRVFR01-03  
AIPWSRVFR03-03  
AIPWSRVFR10-03

### OREIS Project Description:

AIP SO RU November 2003 Split  
AIP SO RU November 2003 02 Split  
AIP SO RU November 2003 03 Split  
AIP SO RU November 2003 04 Split  
AIP SO RU December 2003 Split  
AIP SO RU December 2003 05 Split  
AIP SO RU December 2003 03 Split  
AIP SO RU November 2003 04 Split  
AIP SO RU December 2003 05 Split  
AIP SO RU RW November 2003 Split  
AIP WS RV January 2003 Fryar  
AIP WS RV March 2003 Fryar  
AIP WS RV October 2003 Fryar

Another 32 sets of 2003 Kentucky data were submitted in March 2005 and are awaiting addition to the database.

By **Judy Dickerson and Lauren McDonald**, Ky. Division of Waste Management, Hazardous Waste Branch

## New Face at Site Office ...

**Brad Holland** has joined the Hazardous Waste Branch of the Kentucky Division of Waste Management as the on-site contact at the Department of Energy's (DOE) Paducah Site Office.

Brad's responsibilities include observing cleanup project fieldwork and verifying that it conforms to approved work plans, collecting split samples with DOE, collecting independent samples as part of division oversight, assisting as needed with environmental studies conducted on the division's behalf, and attending private and public meetings among the various agencies and

contractors involved with the Paducah Gaseous Diffusion Plant.

Brad also serves as a local point of contact for citizens requesting environmental sampling related to the plant. He can be reached at



(270) 441-5278.

Brad earned his Bachelor of Science in environmental engineering technology at Murray State University. His 11 years of civil and environmental engineering experience include projects in private consulting, serving as solid/hazardous waste compliance coordinator at an industrial manufacturer, and managing technical services for a wastewater utility.

Brad was born in Mayfield, grew up in Benton, and currently resides in Paducah.

*By Lauren McDonald, Ky. Division of Waste Management, Hazardous Waste Branch*

## ... and Other Personnel Changes

**Jon Maybriar** has been named Supervisor of the Paducah Gaseous Diffusion Plant (PGDP) section of the Hazardous Waste Branch.

Jon has been involved with the state's oversight of environmental investigation and cleanup at PGDP since 1994. He served as project manager for several studies conducted under Agreement in Principle funding, a grant provided to the Kentucky Division of Waste Management by the U.S. Department of Energy. Those projects have included biological sampling and monitoring of surface water, soil and sediment near the PGDP. More recently, Jon has been the state's regulatory project leader

for the Surface Water Operable Unit, a series of investigations and interim cleanup activities addressing PGDP ditches and associated areas.

Jon will represent the Environmental and Public Protection Cabinet on the Paducah Citizens Advisory Board as an *ex officio* (non-voting) member.

**Todd Mullins** and **Brian Begley** were promoted recently to Professional Geologists within the PGDP section. Todd has worked on PGDP environmental oversight projects since 1995. His current responsibilities include regulatory oversight of the Southwest Plume investigation,

interim cleanup of trichloroethylene source areas near the C-400 building, and the Groundwater and Decontamination/Decommissioning operable units.

Brian's responsibilities include split sampling and independent groundwater monitoring of the PGDP and surrounding area (including residences), preparing Geographic Information Systems maps of PGDP environmental data, and groundwater modeling to predict the movement of contaminant plumes at PGDP. He has worked on PGDP oversight projects since 1999.

*By Lauren McDonald, Ky. Division of Waste Management, Hazardous Waste Branch*



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Division of Waste Management

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[www.waste.ky.gov/programs/hw/PGDP+Section.htm](http://www.waste.ky.gov/programs/hw/PGDP+Section.htm)

**Kentucky Environmental Oversight News** is published quarterly by the Kentucky Department for Environmental Protection's Division of Waste Management. It features information about environmental cleanup activities at the Paducah Gaseous Diffusion Plant site and related topics. **Free subscriptions** may be requested from Lauren McDonald (newsletter editor), Hazardous Waste Branch, Division of Waste Management, 14 Reilly Road, Frankfort, KY 40601, (502) 564-6716, FAX (502) 564-2705, e-mail [Lauren.McDonald@ky.gov](mailto:Lauren.McDonald@ky.gov).

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